AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

Listing of the Claims:

Claims 1-10 **(Canceled)**

11. **(Canceled)**

12. **(Previously presented)** The method according to claim 25, wherein the step of analyzing the output waveform includes utilizing chronocoulometry.

13. **(Currently amended)** The method according to claim 25, wherein the step of analyzing the output waveform ~~for presence of the characteristic waveform~~ includes applying the output waveform to a digital lock-in amplifier.

14. **(Withdrawn/ Previously presented)** The method according to claim 25, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes fitting the output waveform to the characteristic waveform.

15. **(Withdrawn/ Currently amended)** The method according to claim 14, wherein the step of fitting the output waveform to the characteristic waveform includes calculating an error between the characteristic waveform and the output waveform.

16. **(Withdrawn/ Previously presented)** The method according to claim 25, wherein the step of analyzing the output waveform for presence of the characteristic waveform includes determining a background signal and subtracting the background signal from the output waveform.

17. **(Previously presented)** The method according to claim 25 wherein the electron transfer moiety comprises a transition metal complex.

18. **(Previously presented)** The method according to claim 25 wherein the target analyte comprises a nucleic acid.

19. **(Withdrawn/ Previously presented)** The method according to claim 25 wherein the target analyte comprises a protein.

20. **(Previously presented)** The method according to claim 25 wherein the input waveform comprises at least a portion having a frequency of about 100 kHz.

21. **(Previously presented)** The method according to claim 25 wherein the input waveform is a voltage waveform and the output waveform is a current waveform.

22. **(Currently amended)** The method according to claim 25 wherein the ~~characteristic~~ output waveform comprises a Gaussian waveform.

23. **(Currently amended)** The method according to claim 25 wherein the ~~characteristic~~ output waveform comprises a modified Gaussian waveform.

24. **(Currently amended)** The method according to claim 25 further comprising predicting the ~~characteristic~~ output waveform, based at least on the electron transfer moiety.

25. **(Currently amended)** A method for detecting the presence of a target analyte[[s]], the method comprising:

providing an electrode comprising a self-assembled monolayer and an assay complex covalently attached to the electrode, the assay complex comprising a target analyte, a capture binding ligand and an electron transfer moiety (ETM) that is responsive to an input waveform~~, wherein in the absence of said target analyte, said ETM is not present~~;

applying [[an]] the input waveform to the electrode to generate~~;~~

~~receiving~~ an output waveform; and ~~that characteristic of the presence of said ETM;~~

analyzing the output waveform using peak recognition ~~to identify electron transfer between the electron transfer moiety and the electrode~~ as an indication of the presence of said target analytes ~~wherein the analyzing step comprises peak recognition~~.

26. (New) The method of claim 25 comprising detecting a plurality of different ETMS each having different potentials as a measure of the presence of a plurality of different target analytes.